Food Away from Home and the Use of Non-Standard Units for Measuring Food Consumption

LECTURE 7

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Today's agenda

1. Acquisition vs. consumption
2. Recall vs. diary and length of reference period
3. List of food items
4. Meal participation
5. Timing of visits
6. Food away from home
7. Non-standard measurement units

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6. Food away from home

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What is food away from home (FAFH)?

- Difficult to identify a single agreed-upon definition
- General preference: definition based on the place of preparation of the food
- FAFH = food prepared away from home
- May be consumed at home or not
- *Examples*: prepared meals and snacks that originate from commercial establishments, social programs, schools, other households…

Importance of measuring FAFH

- Failing to capture FAFH leads to measurement error of total food consumption expenditure and total calorie intake
- Wrong mean:
  - Expenditures and calories will be underestimated
  - Especially problematic for nutrition: FAFH tends to be more calorie-dense and less nutrient-dense than home-made food
- Wrong distribution:
  - FAFH varies with income, so households will be mis-ranked

Does FAFH really matter?

- Are these measurement errors significant in practice?
- Most likely, yes.
- Consumption of food outside the home is rapidly growing across the developing world:
  - Percentage of households reporting meals outside increased from 20 to 46% between 1981 and 1998 in Egypt, 23 to 39% between 1994 and 2010 in India
  - Household per capita expenditure on FAFH rose at an average annual rate of 9.5% in China from 2002 to 2011

Evidence on the importance of FAFH

- Food security: Smith (2015) on the "Indian calorie debate", Borlizzi et al. (2017) on Brazil
- Poverty and inequality: Farfàn, Genoni and Vakis (2017) study Peru and find that the poverty rate increases by 1.1 points (18% of baseline), and the Gini index decreases by 1.3 points, if FAFH is included
- Experimental evidence on questionnaire design: Farfàn, McGee, Perng, and Vakis (2019) on Vietnam

Experimental evidence on capturing FAFH

Farfàn, McGee, Perng, and Vakis (2019)

- 2,400 households in urban Hanoi, Vietnam
- Experimental approach: five different questionnaire designs for capturing FAFH
- What is the impact of different designs on total reported expenditure for FAFH (and therefore on total reported food expenditure)?

Experimental design

T0 - One-line recall, 30 days (status quo in Vietnam in 2016)

T1 - One-line recall, 7 days

T2 - Individual diary, closely supervised (the 'gold standard')

T3 - Individual recall, 7 days

T4 - Household diary with bounding, 7 days ('household informant')

T0 and T1: one-line recall

5A2. Consumption Expenditures on food and drinks in past 30 days (end)

Code	1 Apart from festive occasions, parties, engagement parties, weddings, funerals and major death anniversaries over the past 30 days, which of the following items has your household consumed: Mark with x Question 1 applies to all categories of items/items before moving to questions 2-5	Unit of measurement	2 How much has your household consumed over the past 30 days? Quantity	Value	Breakdown 3. Consumed quantity of purchase or exchange Quantity	Value	4. Consumed quantity of self-subsidy Quantity	Value	5. Consumed quantity of gift, donation, present Quantity	Value
153	Outside meals and drinks? (breakfast, lunch, dinner)?		X	X	X		X		X	
153	Meals and drinks of household members working in the household		X	X	X		X		X	
153	Meals and drinks of household members working, studying, health treatment are away from home		X	X	X		X		X	
153	Others		X	X	X		X		X	
152	Other food and drinks? (other processed food and foodstuff, additives, seasonings, ...)		X	X	X		X		X	

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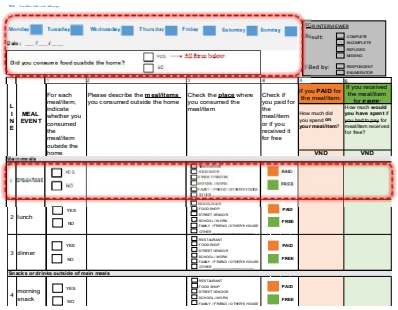
T2: individual diary



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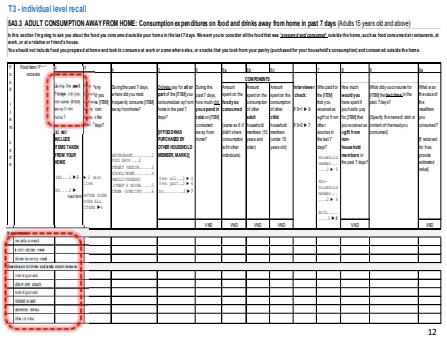
T3: individual recall



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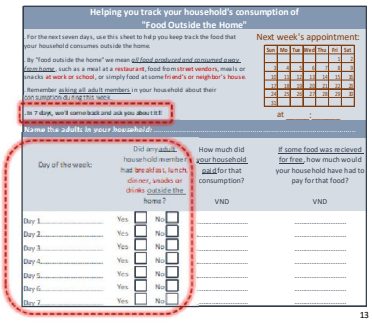
T4: household diary and bounding


Helping you track your household's consumption of "Food Outside the Home"

For the next seven days, use this sheet to help you keep track the food that your household consumes outside the home.

By "food outside the home" we mean all food produced and consumed away from home, such as a meal at a restaurant, food from street vendors, meals or snacks at work or school, or simply food at some friend's or neighbor's house.

Remember asking all adult members in your household about their consumption during this week.

In 7 days, we'll come back and ask you about it!

Next week's appointment:

Sun Mo Tue Wed Thu Fri Sat

at ____ : ____

Name the adults in your household: .....

Day of the week:	Did any adult household member had breakfast, lunch, dinner, snacks or drinks outside the home?	How much did your household paid for that consumption? VND	If some food was received for free, how much would your household have had to pay for that food? VND
Day 1.....	Yes ☐ No ☐	.....	.....
Day 2.....	Yes ☐ No ☐	.....	.....
Day 3.....	Yes ☐ No ☐	.....	.....
Day 4.....	Yes ☐ No ☐	.....	.....
Day 5.....	Yes ☐ No ☐	.....	.....
Day 6.....	Yes ☐ No ☐	.....	.....
Day 7.....	Yes ☐ No ☐	.....	.....

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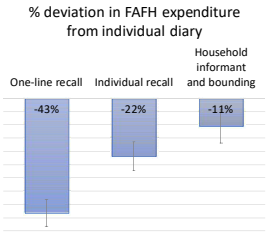
Results



- One line is not enough: greatest underestimation of FAFH (-43%), in part because households do not report any FAFH at all
- Household informant performs well in this case: likely due to the specific way it was implemented (bounding, worksheet helping to track other hh members)

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Current practices

- Serious data gap
- Most nationally representative household surveys collect very limited information on food away from home
- Dupriez et al. (2014): assessment of 100 surveys from developing countries
- 90 out of 100 surveys collect "some" information on FAFH. Of these 90 surveys…

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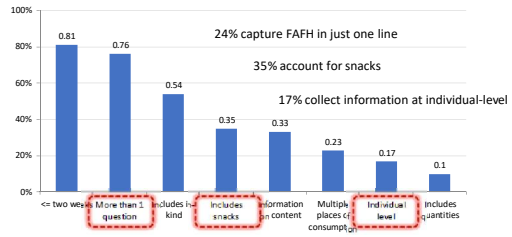
Current practices

Smith et al. (2014)



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Main data collection challenges

- Definition of FAFH: no agreed-upon standards.
- Regardless of definition, there should be a protocol to handle ambiguities (consumed out but prepared at home). They can, otherwise, generate confusion or be missed altogether
- Accounting for snacks: may seem irrelevant, but are not
- A proxy respondent is common, but second-best
- Content and quantities: not all meals created equal. Difficult to quantify what is eaten and how much (which matters for nutrition, but also poverty). Recording meal events and mode of acquisition may help

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Recommendations

1. Design a separate module for FAFH: do not collect FAFH information with just one question
2. Have a clear protocol that specifies whether survey will capture:
   - food prepared at home and consumed outside (jointly with "at-home" module)
   - food prepared outside and consumed at home (i.e. takeout)
3. Which pieces of information to collect?
   - Organize data collection around meal events, including snacks and drinks (adapt the meal events list to the local context)
   - At a minimum, collect info on the value of all meals consumed during each meal event

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Recommendations

4. For whom to collect, and who is the respondent? Two options:
   - Individual level FAFH module. Adults can respond for themselves
   - Proxy respondents (household level module):
     - Proxy respondent reports incidence of FAFH for all household members, while information on expenditures is collected from each adult
     - Proxy respondent reports on the incidence and total value of FAFH consumption at the household level, using daily reminder sheet (requires two visits)

How to choose? Trade-off between feasibility and cost

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7. Non-standard measurement units

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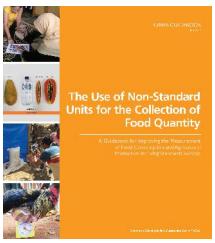
Main reference for this topic



Oseni, Durazo, and McGee (2017)
Non-standard units LSMS Guidebook

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What are non-standard units (NSU)?

- Standard units (SUs): standardized across all locations, items
- Nonstandard units (NSUs): weights can vary by item, location, customs, type of food preparation…

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What are non-standard units (NSU)?
Uganda

Table 1: Examples of SUs & NSUs

Standard	Nonstandard	
	X-Country Applicable	Country-Specific (Uganda)
Kilograms	Sack	Jerrican
Grams	Bunch	Kimbo/Blueband tin
Liters	Heap	Nido tin
Centiliters	Piece/number	Nice cup
Pounds	Bucket	Plastic basin

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What are non-standard units (NSU)?
Nigeria

Table 2: Regional variation of NSUs in Nigeria

Shaded cells = units rarely/never observed in that zone

	% of all NSU observations in Zone					
	North Central	North East	North West	South East	South South	South West
Mudu	56.7	62.4	17.4	0.0	0.7	0.0
Olodo	0.0	0.0	0.0	0.0	14.0	0.0
Congo	7.5	0.0	0.0	0.0	0.0	47.9
Paint rubber	3.9	0.2	0.6	12.1	0.0	2.7
Derica	0.4	1.3	0.2	2.5	16.1	13.8
Milk cup	27.3	8.9	21.4	21.6	42.6	28.8
Cigarette cup	0.5	0.0	0.1	60.7	22.3	0.0
Tiya	0.0	26.7	58.5	0.0	0.0	0.0
Kobiowu	2.8	0.0	0.0	0.0	0.0	0.0

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Advantages of NSUs

1. May be more familiar to respondents
   - SUs may not be used in markets
   - Respondents may not encounter SUs in their daily activities
   - Items may traditionally be consumed in NSUs
   - Evidence: When given the choice, respondents prefer reporting in NSUs. In Malawi IHPS 2013, 73% of consumed item entries are in NSUs
2. Simplified recall: reduces on-the-spot calculations, cognitive burden

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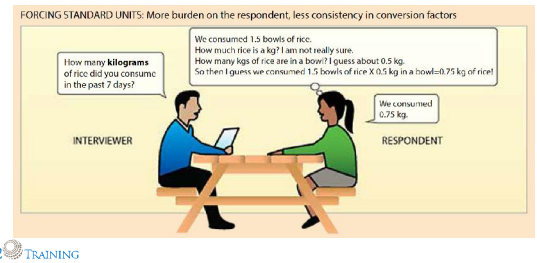
In practice
standard units



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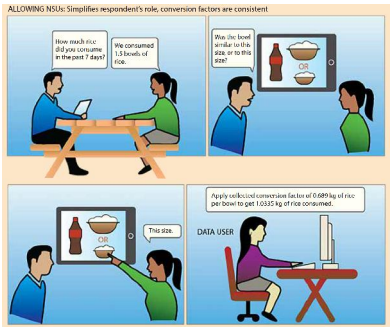
In practice
non-standard units



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Disadvantages of NSUs

1. Complex to collect: may vary by item, location…
2. Not always clearly defined:
   - A 'piece' of bread?
   - A container can be filled level or heaped
   - A common unit in Ethiopia: chinet (donkey load)
3. Need to be converted into SUs for analysis

Dengu (basket) in Malawi

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Compiling and using non-standard units

- The use of NSUs in household surveys requires the construction of a NSU library
- Its components are:
  - List of 'allowable' item-NSU combinations
  - Conversion factors for each combination (national, regional)
  - Reference photos for each combination
  - Clear protocols for using conversion factors and reference photos
  - Documentation, documentation, documentation

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A checklist for using non-standard units

- ❑ Establish a NSU list
- ❑ Compile conversion factors
- ❑ Take reference pictures
- ❑ Integrate NSUs into main survey
- ❑ Implement in CAPI (optional)

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☑ Establish a NSU list

- Plan in advance of main survey, and construct all allowable item-NSU combinations
  - How? National sources, previous surveys, conduct a pilot
- Identify variation:
  - Units: heaps, pails, pieces
  - Sizes: small, medium, large
  - Conditions: shelled, unshelled, threshed, etc.

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☑ Compile conversion factors

- Kilogram conversion for each item-NSU combination, possibly disaggregated by region: required to calculate consumption, calories, agricultural production-related outcomes, etc.

IHS3 Item Code	Item Name and Type	Unit Code	Unit Description	Regional Mean in KGs		
				North Region	*Central Region*	*South Region*
201	Cassava tubers	9	Piece	0.30	0.32	0.36
		9A	Piece (small)	0.13	0.18	0.21
		9B	Piece (medium)	0.30	0.32	0.36
		9C	Piece (large)	0.46	0.56	0.68
		10	Heap	0.98	1.20	1.12
205	Irish potato	4A	Pail (small)	3.01	3.23	4.49
		4B	Pail (medium)	9.31	8.24	6.71

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How to compute conversion factors?

- With a market survey
- Market selection and visits:
  - Ensure adequate sub-national coverage of item-NSU combinations
  - Cover the full range of types of markets likely frequented by households
  - Market day vs. non-market day
- Timing:
  - Seasonality in item availability (multiple rounds?), harvest time
  - Ideal scenario:
  1. Prior to main survey: Implement market survey: obtain conversion factors, collect reference photos to use in main survey
  2. During/after main survey: Consider implementing a smaller scale market survey to address gaps in reported item-NSU-(condition) combinations in main survey

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Market survey
example: Ethiopia

MODULE B: ITEM-UNIT MEASUREMENT - NONCONTAINERS

1	2	3	4	5	6	7		8	
ITEM NAME	ITEM CODE	UNIT NAME	SIZE	Was item measured? YES.....1 (▶ 9) NO.....2	Why was item not measured? NOT FOUND IN MARKET AT THIS TIME.....1 CROP NOT COMMONLY FOUND IN THIS MARKET.....2 UNIT NOT COMMONLY FOUND IN THIS MARKET.....3 OTHER,SPECIFY.....4 ALL RESPONSES (▶ NEXT ITEM)	Item Sample #1		Item Sample #2	
						Weight (KGs)	Price (Birr)	Weight (KGs)	Price (Birr)
VEGETABLES									
ONION	58	PIECES	Small						
	58		Medium						
	58		Large						
	58	MEDEB	Small						
	58		Medium						
	58		Large						

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Market survey
implementation and results

- Attempt to weigh each item-NSU combination in each market
- If possible, take weights from multiple vendors (up to 3)
- Refine initial list of item-NSU combinations, if necessary
- Derive a median conversion factor for each combination, at the national level and, if necessary, regional level
- Incomplete set of conversion factors implies a problematic loss of information on reported food consumption: try to minimize missing values

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Conversion factor database
Example: Nigeria

ITEM CODE	ITEM NAME	UNIT CODE	UNIT DESCRIPTION	UNIT SIZE	CONVERSION FACTOR (KG)						
					NATIONAL	BY ZONE					
						NORTH CENTRAL	NORTH EAST	NORTH WEST	SOUTH EAST	SOUTH SOUTH	SOUTH WEST
GRAINS AND FLOURS											
22	Maize (grains, off the cob)	11	Paint rubber		3.667	3.590	3.667	3.667	3.558	3.735	3.845
		12	Milk cup		0.167	0.197	0.146	0.173	0.170	0.167	0.158
		13	Cigarette cup		0.189	0.189	0.189	0.189	0.208	0.170	0.189
		14	Tin		14.513	15.070	14.513	14.513	13.955	14.513	14.513
		20	Congo	Small	0.825	1.110	0.825	0.825	0.825	0.825	0.683
		21	Congo	Large	1.450	1.375	1.450	1.450	1.450	1.450	1.475
		30	Mudu	Small	0.892	0.772	1.073	0.892	0.892	0.892	0.892
		31	Mudu	Large	1.316	1.270	1.203	1.407	1.316	1.316	1.316
		40	Derica	Small	0.140	0.140	0.140	0.140	0.140	0.140	0.140
		41	Derica	Medium	0.538	0.538	0.602	0.538	0.538	0.538	0.345
		42	Derica	Large	0.717	0.717	0.695	0.717	0.717	0.717	0.728
		43	Derica	Very large	1.836	1.836	1.836	1.836	1.815	1.810	1.925
		50	Tiya	Small	1.225	1.225	1.225	1.225	1.225	1.225	1.225
		51	Tiya	Medium	1.870	1.870	1.870	1.870	1.870	1.870	1.870
		52	Tiya	Large	2.515	2.515	2.515	2.515	2.515	2.515	2.515
		60	Kolowu	Small	0.610	0.610	0.610	0.610	0.610	0.610	0.610
		61	Kolowu	Large	1.208	1.208	1.208	1.208	1.208	1.208	1.208

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☑ Take reference photos

- Developed in market survey, to be used in main survey
- Goals: help respondents better specify quantities, provide standard size for NSUs that are not clearly defined (e.g. piece, heap)
- Not as easy as taking a selfie!
  - General guidelines for taking photos
  - Select quality photos for reference guide
  - Properly train enumerators to use NSU materials

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Example: incorrect reference photos

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Example: correct reference photos

Sahins of rapeseed

Heaps of papaya

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☑ Integrate NSUs into main survey

- Revise questionnaire modules to record food consumption in NSUs
- Define clear protocols and training for field staff on the use of NSUs, reference photos
- Define clear protocols for data users and anaysts on the use of conversion factors

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☑ Implement on CAPI (optional)

- Market survey
  - Take a (uniquely-named) photo for each weight measurement within CAPI app
  - Georeference market locations; automatic date and time capture
  - Rigorous data quality checks: range checks, flagging missing observations
- Main survey
  - Reference photos can be integrated into CAPI app
  - Additional photos at the household-level can be taken
  - Rigorous data quality checks based on:
    - Allowable item-NSU combinations
    - Conversion factor library for flagging potential "outlier" quantities based on checks on the basis of unit values, food consumption and/or caloric intake per capita

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Recommendations

FAO/WB manual

1. Decision on whether to allow for NSUs should be addressed in the questionnaire design phase, to minimize tendency to determine units of measurement on an ad-hoc or inconsistent basis during fieldwork
2. Careful evaluation of cost vs. benefit of allowing NSUs. May conduct pilot survey to determine to which extent NSUs are actually needed by respondents
3. Complete list of conversion factors is essential. Market surveys, photo references can help
4. NSOs and implementation partners should work together to establish NSU database that can be used across surveys

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Lessons learned

- This lecture has explored specific topics in the design of the food module:
  - How to measure food prepared away from home?
  - When and how to use non-standard measurement units?
- The first issue should be addressed by all surveys: growing relevance of FAFH as a component of food consumption
- Allowing for non-standard units may be useful in some context, but implementation should carefully follow guidelines

References

Required readings

FAO and The World Bank (2018). Food data collection in Household Consumption and Expenditure Surveys. Guidelines for low- and middle-income countries. Rome.
Sections 2.5, 2.7, 3.5, 3.7.

Smith, L. C., Dupriez, O., and Troubat, N. (2014). Assessment of the reliability and relevance of the food data collected in national household consumption and expenditure surveys. International Household Survey Network.
Section 3.6.

Oseni, G., Durazo, J., and McGee, K. (2017). The Use of Non-Standard Units for the Collection of Food Quantity. LSMS guidebook.

Suggested readings

Borlizzi, A., Delgrossi, M. E., & Cafiero, C. (2017). National food security assessment through the analysis of food consumption data from Household Consumption and Expenditure Surveys: The case of Brazil's Pesquisa de Orçamento Familiares 2008/09. Food policy, 72, 20-26.

Farfan, G., Genoni, M. E., & Vakis, R. (2017). You are what (and where) you eat: Capturing food away from home in welfare measures. Food Policy, 72, 146-156.

Farfan, G., McGee, K. B., Perng, J., & Vakis, R. (2019). Poverty Measurement in the Era of Food Away from Home: Testing Alternative Approaches in Vietnam. Policy Research Working Paper Series 8692, The World Bank.

Smith, L. C. (2015). The great Indian calorie debate: Explaining rising undernourishment during India's rapid economic growth. Food Policy, 50, 53-67.

Homework

Exercise 1 – Engaging with the Literature

- Smith (2015) demonstrates the importance of accounting for the consumption of food away from home when assessing nutritional outcomes.
- Write a short essay (not to exceed 3000 characters) where you summarize the main findings of the paper.

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Exercise 2 – FAFH modules

Tanzania, 2014

Comment on the main differences of the following FAFH survey instruments. Based on Smith et al. (2014) (section 3.6) what can be said about the reliability of data collected from the two modules?

SECTION E: FOOD CONSUMPTION OUTSIDE THE HH

DO NOT INCLUDE GIFTS OF [ITEM] GIVEN OUT BY [NAME] BUT DO INCLUDE GIFTS OF [ITEM] RECEIVED BY [NAME]. IF CONSUMED BUT NOT PURCHASED ASK MARKET VALUE.

INDIVIDUAL ID	1. Did [NAME] consume any meals/ snacks/ drinks outside the household in the past 7 days?	2. In the past 7 days did [NAME] consume any full meals (**breakfast, lunch or dinner**) outside of the household?	3. What was the value of this consumption?	4. In the past 7 days did [NAME] consume any **barbecued meat, chips, roast bananas and other snacks** prepared on charcoal outside of the household?	5. What was the value of this consumption?	6. In the past 7 days did [NAME] consume any **kibuku and other local brews** outside of the household?	7. What was the value of this consumption?	8. In the past 7 days did [NAME] consume any **wine, commercial beer and spirits** outside of the household?	9. What was the value of this consumption?	10. In the past 7 days did [NAME] consume any **sodas and other non-acoholic drinks** outside of the household?	11. What was the value of this consumption?	12. In the past 7 days did [NAME] consume any **sweets, ice-cream** outside of the household?	13. What was the value of this consumption?	14. In the past 7 days did [NAME] consume any **tea, coffee, samosa, cake and other hoteli snacks** outside of the household?	15. What was the value of this consumption?
	YES..1 NO..2 (►NEXT)	YES..1 NO..2 (►4)	TSH	YES..1 NO..2 (►6)	TSH	YES..1 NO..2 (►8)	TSH	YES..1 NO..2 (►10)	TSH	YES..1 NO..2 (►12)	TSH	YES..1 NO..2 (►14)	TSH	YES..1 NO..2 (►NEXT)	TSH

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Exercise 2 – FAFH modules

Uganda, 2016

Part B: Food and Beverage (During the Last 7 Days)

Item Description	Code	Did your HH consume [ITEM] 1= Yes 2=No >>NEXT ITEM	How many days was [ITEM] consumed out of the last 7 days?	In what unit can you best quantify / describe the amount of [ITEM] consumed? CODES	State in which food was mainly consumed in the last 7 days 1=Baked 2=Boiled 3=Fried 4=Raw/fresh 5=Roasted 6=Steamed 7=None	AT HOME: How many [CEB05] of [ITEM] did your household purchase for consumption at home during the last 7 days?	AT HOME: How much did the household spend in total on these [CEB06] [CEB05] of [ITEM] during the last 7 days? for consumption at home UGX	Away from home: How many [CEB05] of [ITEM] did your household purchase for consumption away from home during the last 7 days?	Away from home: How much did the household spend in total on these [CEB08] [CEB05] of [ITEM] during the last 7 days? for consumption away from home UGX	OUT OF HOME PRODUCTION: How many [CEB05of [ITEM] did your household consumed out of home production during the last 7 days?	OUT OF HOME PRODUCTION: What would be the total value of these [CEB10] [CEB05of [ITEM] if you were to sell them at the farm gate UGX	Received in-kind/Free: How many [CEB05] of [ITEM] did your household received in-kind/free for consumption during the last 7 days?	Received in-kind/Free: What would be the total value of these CEB10] [CEB05] of [ITEM] if you were to sell them in the market? UGX	Market Price Value per [CEB05] of [ITEM]	Farm gate /producer price per [CEB05] of [ITEM]
CEB01	CEB02	CEB03	CEB04	CEB05	CEB05A	CEB06	CEB07	CEB08	CEB09	CEB10	CEB11	CEB12	CEB13	CEB14	CEB15

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Exercise 3 – Non-standard measurement units

Explain how you would improve on each of these reference photos for non-standard measurement units.

1

2

3